

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:)	
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Juro Ozeki et al.)	Group Art Unit: 1796
)	
Application No.: 10/524,135)	Examiner: Patrick Dennis Niland
)	
Filed: April 5, 2006)	
)	
For: Polyphenylene Ether Based Resin)	Confirmation No.: 2415
Composition)	

Commissioner for Patents
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Sir:

RESPONSE

In the Office Action of April 16, 2008, the Examiner rejected claims 1, 3, 5 and 6 under 35 U.S.C. §103(a) for being obvious over newly cited U.S. Patent No. 5,332,784 to Shiraki et al., hereafter Shiraki, in view of Coran.

Claim 1 relates to a polyphenylene ester based resin composition that comprises:

- (a) a polyphenylene ether based resin and optionally a styrene based resin;
- (b) a styrene based thermoplastic elastomer modified with an imidazolidinone

compound; and

- (c) a clay that has been surface treated with a silane compound.

Shiraki discloses a polyphenylene ether resin (component (a) of the present invention) and a styrene based thermoplastic elastomer modified with an imidazolidinone compound (component (b) of the present invention). Further, Shiraki discloses clay as an example of a reinforcement or filler which may be incorporated into

the composition within limits not deleterious to its property (see col. 25, lines 51-54 of Shiraki).

The only examples where component (a) of the present invention is used are Example 74 and Comparative Example 17. See Table 13 in col. 39 of Shiraki. Here it is shown that the Izod impact resistance is improved by replacing an unmodified block copolymer with a terminal-modified block copolymer. However, Shiraki is completely silent about any improvement in impact resistance by the addition of the inorganic filler such as clay, and also the other effects of the present invention. Furthermore, Shiraki does not disclose or suggest a clay that has been surface treated with a silane compound (component (c) of the present invention).

Coran discloses a rubber composition in which a component corresponding to component (c) of the present invention is incorporated into a rubber component. However, the composition is distinct from the composition of the present invention, and the effects mentioned therein are also different from the present invention.

As described in the "Background Art" section of the present application, when an inorganic filler such as clay is added to a polyphenylene ether based resin (component (a) to improve its flexural modulus (rigidity), the impact resistance and the surface smoothness of an article molded from it are lowered. The present invention is directed to a technique of improving the flexural modulus (rigidity) of component (a) while simultaneously suppressing deterioration in surface smoothness of a molded article, and further improving its impact resistance and tensile strength (toughness).

Referring to Example 1, it can be seen that the composition comprising components (a), (b), and (c) and also (d) exhibits an excellent balance of physical

properties. On the other hand, in Comparative Example 1, in which component (b) is replaced with an unmodified elastomer component, such an excellent balance of physical properties is not obtained. See the excerpt (1) from Table 1 below.

Further, comparing Example 2 (composition of the present invention) with Comparative Example 3 (composition where component (b) of Example 2 is replaced with a maleic anhydride-modified elastomer), the composition of Comparative Example 3 has a deteriorated physical property balance (particularly, "Izod impact value" and "elongation at break"). Comparative Example 2 (a composition where component (c) of Comparative Example 3 is replaced with a non-treated clay) shows further marked deterioration in the physical property balance. See the excerpt (2) from Table 1 below.

Excerpt (1) from Table 1

	Unit	Ex. 1	Comp. Ex. 1
Polyphenylene ether: a-1	%	71.4	71.4
Thermoplastic elastomer: b-1 b-3	%	5.5	5.5
Inorganic filler: c-2	%	22.0	22.0
BHT	%	1.1	1.1
Aromatic phosphoric ester based flame retarder: d-1	Part	11.0	11.0
Drop impact strength	J	44	14
IZOD impact value	J/m	108	39
Flexural modulus	MPa	3800	3800
Elongation at break	%	100<	8
Gloss	%	88	50

Excerpt (2) from Table 1

	Unit	Ex. 2	Comp. Ex. 2	Comp. Ex. 3
Polyphenylene ether: a-1	%	71.4	71.4	71.4
Thermoplastic elastomer: b-2 b-3	%	5.5	5.5	5.5
Inorganic filler: c-1 c-3	%	22.0	22.0	22.0
BHT	%	1.1	1.1	1.1
Aromatic phosphoric ester based flame retarder: d-1	Part	11.0	11.0	11.0
Drop impact strength	J	40	10	35
IZOD impact value	J/m	98	59	59
Flexural modulus	MPa	3700	3700	3750
Elongation at break	%	80<	18	22
Gloss	%	80	48	72

As can be seen from the above, the excellent physical property balance of the present invention cannot be obtained unless components (a), (b) and (c) are used in combination.

The composition of Shiraki and the composition of Coran are each distinct from each other and the specific composition of the present invention comprising components (a), (b) and (c). Further, the effects addressed therein are different from the present invention.

Consequently, it is submitted that other than the teaching gleaned from reading Applicants' specification, there is no suggestion to one skilled in the art to use the treated clay of Coran in place of the untreated clay of Shiraki in combination with the specific components (a) and (b).

As noted in M.P.E.P §2142 "impermissible hindsight must be avoided and the legal conclusion [of obviousness] must be reached on the basis of facts gleaned from the prior art." There is nothing in the prior art, either in Shiraki or Coran to suggest the excellent balance in properties obtained as discussed above if component (c) is combined with components (a) and (b).

Accordingly, it is submitted that the Examiner has not clearly articulated all of the reasons why the claimed invention would have been obvious as required by M.P.E.P §2142. See also M.P.E.P §2143(G). Withdrawal of the rejection of claims 1, 3, 5 and 6 over Shiraki in view of Coran is therefore requested.


It is believed claims 1, 3, 5 and 6 are in condition for allowance

A one-month Petition for Extension of Time is being filed concurrently with this Response. If there are any additional fees due, please charge such fees to our Deposit Account 06-0916.

Respectfully submitted,

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Dated: August 18, 2008

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